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Female Genital Tuberculosis.—Tuberculosis of the female generative organs is very rare, and almost always secondary when it does occur. Tuberculosis of the fallopian tubes constitutes about 5 to 10 per cent of the inflammatory lesions of these structures. The most common form of genital tuberculosis is tuberculous salpingitis. In virgin women marked inflammation of the tubes is almost always the result of tuberculous infection. Haematogenous infection of the genital organs is rare; the common mode of infection is by continuity of tuberculosis of the peritoneum. There are no characteristic symptoms of tuberculous salpingitis, although the onset is usually more insidious, and the symptoms are not as severe as in gonorrhoeal salpingitis. The treatment is surgical and consists of a panhysterectomy. The ovaries should always be removed. Tuberculosis of the vulva, vagina, ovaries and cervix is rare and the symptoms usually local, and the treatment surgical removal, cauterization, X-ray or radium.—*Tuberculosis of the Female Genital Tract, D. B. Allman, M. J. & Rec., June 6, 1928, cxxvii, 609.*—(*H. McL. R.*)

Tuberculosis of Bartholin's Gland.—Tuberculosis of the external female genitalia is uncommon. When present, the lesion is usually superficial, the vagina is relatively immune, and the urethra is rarely affected. A case is reported of an unmarried female, aged 21, with a history of slightly active pulmonary tuberculosis for a year previously, who complained of leucorrhoeal discharge and soreness of the vulva. An earlier swelling on the left side of the vulva had, after two months, ruptured and healed. At the time of examination there were enlarged lymph nodes in the right groin, the vulva was covered with a thin grayish-brown discharge, and there was slight induration in the region of the right Bartholin gland. Two weeks later the condition was more acute, with considerable swelling. Cultures showed only the colon bacillus. Under general anaesthesia, the gland was excised and proved to be tuberculous. The chronicity of the condition, the absence of the usual signs of acute inflammation, and the thin brownish discharge, all suggest that this type of infection is tuberculous.—*Tuberculosis of Bartholin's Gland, W. D. Fullerton, J. Am. M. Ass., October 20, 1928, xci, 1175.*—(*G. L. L.*)

Hypoglycaemia in Addison's Disease.—It is still questionable whether the symptomatology of Addison's disease is caused by a destruction of chromaffin or interrenal tissue or both. Most authors believe that both functional systems are impaired and

that the low blood-pressure, the high tolerance for glucose, the low glucose content of the blood, the absence of glycosuria following adrenalin injection, the adynamia, and the pigmentation are due to an impairment of the chromaffin tissue, while the gastrointestinal symptoms, the psychological disturbances, delirium, convulsions, and coma are supposed to be caused by impairment of the cortical tissue. However, all the so called cortical symptoms resemble greatly those found during hypoglycaemic shock. It is well known that some tuberculous diabetics are hypersensitive to insulin and that in these patients insulin shock can be prevented by the simultaneous administration of adrenalin, which causes mobilization of glycogen in the liver. One case is reported in detail in which the so called cortical symptoms started suddenly simultaneously with hypoglycaemia. The patient's acute symptoms could be controlled several times by intravenous injections of glucose. These observations make it quite likely that the so called cortical symptoms are simply due to hypoglycaemia. Autopsy in this case showed old tuberculous foci in both apices, fibrocaseous tuberculosis of both adrenals which almost completely destroyed both glands. According to clinical observations, there can be no doubt that the destruction of the adrenal glands causes severe disturbance of the carbohydrate metabolism. It appears that adrenalin and insulin are antagonistic in their respective actions. It may then be supposed that Addison's disease causes an accelerated oxidation of glucose, and consequently a depletion of glycogen storage. This would explain the occurrence of hypoglycaemic reactions. Both the nature of the clinical symptomatology and the success of the administration of glucose make it very likely that at least some of the so called cortical symptoms are caused by hypoglycaemia.—*Über Hypoglykämie bei Morbus Addisonii, W. Wadi, Klin. Wchnschr., October 28, 1928, xliv, 2107.—(M. P.)*

Dermatoses in Tuberculosis.—Complete examinations of the skin and oral mucous membrane were made on a group of 2539 patients, to determine the relation between various dermatoses and tuberculosis. Of this group, 759 had tuberculosis, and 315 of these, or 37.15 per cent, had some type of skin disease, while among the 1780 patients without tuberculosis 1066, or 53.15 per cent, had disease of the skin. Therefore, the incidence of skin disease in the tuberculous group was 16 per cent less than among those without tuberculosis. Lupus erythematosus was found only once in the 759 tuberculous patients. In 44 other cases of lupus erythematosus, studied for tuberculosis, the incidence of the latter was 11.11 per cent, less than the incidence of tuberculosis in the general group of 2539 patients. The incidence of tuberculides among tuberculosis patients was greater than among the nontuberculous patients in the ratio of 0.40 to 0.07 per cent. Fifty per cent of the patients with tuberculides had tuberculosis, whereas the incidence of tuberculosis in the whole group of patients with skin disease was 22.81 per cent. Tuberculosis was notably less prevalent in patients with psoriasis. This is the only common disease which did not occur in conjunction with tuberculosis, only 4 in a total of 96 cases showing the presence of tuberculosis. Among syphilitic patients in general in this group tuberculosis was as frequent as among nonsyphilitics, but among patients with neurosyphilis tuberculosis was less prevalent. Tinea versicolor, commonly stated to be frequently associated with tuberculosis, was represented by 7 cases, or 0.92 per cent, in the tuberculous group, and by 26, or 1.46 per cent, in the nontuberculous group. Lupus erythematosus, livido reticularis, chronic urticaria, and papulonecrotic tuberculides showed a higher incidence in the tuberculous group than among the nontuberculous. From the results of the study, however, it would seem hazardous to associate any skin disease with tuberculosis because it occurred in tuberculosis patients.—*Common Dermatoses Encountered among Tuberculous and Non-Tuberculous Ex-Service Patients, F. J. Eichenlaub, J. Am. M. Ass., August 25, 1928, xci, 545.—(G. L. L.)*

Treatment of Psoriasis Associated with Tuberculosis.—Whether one agrees that there is some important aetiological link between psoriasis and tuberculosis, one must agree that the two diseases are not uncommonly seen together in the same individual. In such cases the question arises as to why the treatment of psoriasis not only does not have a bad influence on the tuberculosis but actually benefits it. The treatment of psoriasis associated with tuberculosis that involves the use of irritating drugs, such as sulphur, guaiacol and eucalyptol, has not given satisfactory results. Good results have followed the application of salicylchrysarobin paste, although there are individuals with pulmonary tuberculosis, especially those with a tendency to bleed, to whom this remedy must be cautiously administered. Triphal given intravenously biweekly exerts a helpful influence on both diseases when they coexist. Arsenic yields very good results, but there is a certain

number of cases that are refractory to this drug. Such cases may usually be satisfactorily treated by the local application of chrysarobin salve made up in 0.25 per cent zinc paste together with intravenous injection of salicylates.—*Die praktische Therapie der Psoriasis bei Tuberkulose, Hübner, Deutsche med. Wchnschr., November 11, 1927, liii, 1941.*—(*H. S. W.*)

Lupus.—Statistics from the Finsen Light Institute show that 75 per cent of patients with facial lupus exhibit a nasal lesion, and some observers say that cutaneous lupus is always secondary to a nasal focus. In the larynx it may be primary or secondary. It frequently attacks only the epiglottis and is painless. Patients may be seen in whom the epiglottis has quite healed, with a large loss of tissue, and who had never had any treatment, and whose attention had never been attracted to their throat by either huskiness or dysphagia. The treatment consists of sanatorium care and the galvanocautery.—*Lupus: Particularly of the Nose, Pharynx, Mouth, and Larynx, S. Thomson, Tubercle, June, 1928, ix, 405.*—(*W. I. W.*)

Local Treatment of Lupus Vulgaris.—The treatment of this disease aims at its eradication and the leaving of a supple and unnoticeable cicatrix. Such results are claimed by the use of the method of treatment to be described. Wash the skin of the diseased area with soap and water; then swab with methylated spirit. Paint the area with *liquor hydrargyri nitratis acidus* until the tissues become grey, or until coagulation has taken place. Cover the area over with lint spread with the following ointment: Ac. carbol., *m*xv.; ung. zinc., oz. i. The dressing should be made air-tight and should be left in position for forty-eight hours. If one application is not sufficient it may be repeated any number of times. When ulceration has become deep enough, replace the dressing with Brooke's ointment. The formula for this is given. Two cases are reported, one a case of lupus of the neck and the other of the cheek. Good cosmetic results were obtained.—*A Method of Treating Lupus Vulgaris, A. R. Somerford, Lancet, June 9, 1928, ccxiv, 1173.*—(*H. McL. R.*)

Capacity of Lupus Patients for Work.—The capacity of patients with lupus for work depends upon several factors. It is especially important to consider the partial disability. The question must be looked at from the view of workmen's compensation. One is to be considered disabled (1) whenever the disease is widespread over the body or is present in many patches and has a tendency to progress, or when the general constitution of the body is considerably impaired; (2) when there is disease of the hand in those doing manual labor or (3) disease of the lower extremities in persons whose occupation requires free movement of those parts; (4) when, on the face, the disease becomes disfiguring or repulsive; (5) when the disease of the lips, mouth or mucous membrane of the throat is sufficient to seriously impair nutrition of the body; (6) if the disease encroaches upon the eye so as to impair vision; and (7) where there is a tuberculous complication (lungs, lymph nodes and bones). These conditions, if of severe grade, create not only temporary but permanent disability. The question of institutional treatment of the various lupus diseases is also of importance. Institutional treatment should be employed in (1) all those cases in which a long-continued, local treatment by a specialist and trained nurse is required; (2) those who cannot walk (because of the site of the disease) and whose vision has been much impaired; (3) those whose disease is extensive or ulcerating; (4) those who are repulsive because of the areas of the disease; (5) those who are particularly sensitive or unreliable and who need regular clinical treatment; (6) those who have unfavorable domestic arrangements; and (7) all those who, in addition to the lupus, have tuberculosis elsewhere in the body which needs treatment.—*Arbeitsunfähigkeit im Sinne der Reichsversicherungsordnung bei Lupuserkrankungen, Helm, Deutsche med. Wchnschr., February 3, 1928, liv, 194.*—(*H. S. W.*)

Lupus Erythematodes.—Lupus erythematodes may occur under very different aspects, so that the differential diagnosis is frequently difficult. The following chief types are distinguished: *1: Lupus erythematodes discoides*, usually found on the cheeks, the nose, temporal zones, ears, front and scalp. *Seborrhoea congestiva* is identical with this type. The localization in mucous membranes is rare. *2: Erythema centrifugum* (Biett). This type progresses centrifugally, leaving frequently atrophic skin in the centre. The localization may be symmetrical or asymmetrical on the face, on the chest, and some times on the extremities. These two forms are characteristically chronic. *3: erythema perstans* begins usually as a chronic eruption. Later on, febrile and septic conditions under the name of *lupus erythematodes acutus* may develop. Concomitant swelling of joints, albuminuria and meningitis are observed. *4: Lupus erythematodes disseminatus subacutus* is probably the connecting link between the chronic

and acute types. The latter form leads usually to complete regressions. *5: Lupus pernio* is usually found in the face and on the extremities, mostly on the fingers. There is a bluish-red oedematous swelling. Chronic lymph-node swellings are frequently present, and also dystrophies of the bones similar to spina ventosa. The histology of the lesions is variegated. There are diffuse perivascular round-cell infiltrations. Polynuclear and plasma cells are usually present. Giant cells have been observed at times. In the stage of involution one finds small haemorrhages and atrophy of the connective tissue, the follicles and the lower layers of the epidermis. The elastic fibres in the cutis are transformed into collagen-like fibres. Hyperkeratosis of the excretory ducts of the sweat glands has been described. The question of whether this disease is strictly tuberculous in nature, or whether it is caused by tubercle bacilli or by its toxins only, has never been settled conclusively. Statistics as to the frequency of other tuberculous lesions in the presence of lupus erythematodes are inconclusive and misleading. Different authors have found this frequency anywhere between 7.5 and 98.4 per cent. The possible aetiological rôle of all microörganisms, streptococci and spirochaetes, has been discussed without elucidating the problem. The demonstration of tubercle bacilli in the lesions by animal inoculation has been successful in a few cases. The most successful therapy is the injection of gold preparations particularly Krysolgan, Triphal and Aurophos. Usually the cosmetic results are very satisfactory. *Über Lupus Erythematodes, K. Ullmann, Wien. klin. Wchnschr., August 9, 1928, xxxii, 1159—(M. P.)*

Miliary Tuberculosis.—There have been recently published a number of cases of *granulie* characterized by torpid, apyretic evolution, sometimes curable, and at least chronic. Burnand and Sayé have termed these *granulie froide.* An inaccuracy of language has attached to the appellations of *granulie* and *miliary tuberculosis.* In this study finely nodular disseminated pulmonary lesions are considered, omitting the forms seen in infants, young children, and unexposed primitive people such as the African blacks. The term *granulie* has been, unfortunately, much in use in France, and foreign physicians reading it are not even sure that it refers to tuberculosis. Contemporary works have long since closed the debates between the "dualists" and "unicists," and everyone acknowledges the common origin of follicular and specific inflammatory lesions; nevertheless, Virchow's great shadow continues to haunt modern phthisiologists, and dualism has found its last barrier in the "*granulie*" of Empis. The word seems to denote a lesion,—not a disease,—of special pathogenesis (haematogenous), topography (interstitial), and structure (connective tissue and follicular), and to be associated with grave symptoms and fatal prognosis. *Clinical Features:* Two very frequently appearing phenomena, whether the disease be acute, subacute or chronic, are haemoptyses and pleural exudates. Haemoptyses are often the first premonitory sign, preceding the determination of symptoms and lesions sometimes by several months. The functional and general symptoms are variable, as is the evolution. The only common physical sign, not always present, is diminished vesicular murmur. Adventitious sounds, when they exist, are usually in the form of fine discrete disseminated crepitations, later perhaps combined with sibilant and sonorous râles which simulate an acute or capillary bronchitis. *Roentgenographic Features:* These really make the diagnosis, because of the scarcity of physical signs, and have also confirmed the existence of *granulie froide.* A stippled appearance of the pulmonary fields presumes the existence of a generalized miliary tuberculosis, but the picture must be taken under good conditions, in apnoea, and with a fraction of a second exposure. Certain features distinguish the acute from the chronic forms. In the former, the background is generally less gray and the spaces between the granulations are clearer. The shadows of *granulies froides* have generally less sharply defined borders, and the granulations are less visible through the opacity of the ribs. Gräff and Kupferle's classification is too minute and pretends to too much knowledge of too many factors to be strictly dependable. *Clinical Forms:* It is especially the symptoms and evolution which distinguish the two principal forms of miliary tuberculosis, acute and chronic. General, predominantly respiratory, and latent forms have been described, the respiratory being subdivided into (1) suffocating (tuberculous asphyxia of Graves), (2) catarrhal, and (3) pleural. Among the latent forms may be mentioned the "pseudo-septicaemic form," and the "gastric fever" of Hanot. There are apyretic forms, the patient showing extreme weakness, emaciation and digestive disturbance, followed suddenly by a lapse into coma and meningeal symptoms. Subtle histological distinctions have led to doubts of the transformation of miliary tuberculosis into subacute caseous or even fibrocaseous disease, but such an evolution has been confirmed by numerous

writers. *Granulies froides* behave in various ways. They may suddenly terminate in a meningitis, may progressively extend, or may undergo caseous or fibrocaseous transformation; finally, they may cure, sometimes rapidly and completely. Bard attributes certain dense pulmonary scleroses to encapsulation of miliary foci. Outside of the acute cases, however, in which death is inevitable, a prognosis seems impossible without a period of observation. The early presence of an ulcerovegetative laryngitis is, however, of unfavorable import. The cutireaction is conditioned by the state of the patient. Usually it is negative or feeble in acute or prolonged subacute miliary disease, but it may also be feeble in moderately febrile patients in good condition who are not yet cachectic. *Pathological Anatomy:* Laennec recognized and described both miliary tubercles and miliary tuberculous granulations (previously noted by Bayle) and insisted on their frequent coexistence. On the other hand, Letulle and Bezançon in their recent work believe there are two fundamentally distinct types of lesions, both in origin and structure, the tuberculous granulation being an inflammatory connective-tissue nodule formed by the coalescence of a number of primitive giant-cell follicles, while the miliary tubercle represents a small focus of bronchopneumonia and bronchoalveolitis; the former is incorporated in a protoplasmic mass in intimate relation with blood- and lymph-stream; the latter is due to "bacilli projected through the respiratory tract." This is, then, a sort of revived neodualistic hypothesis. Actually, such a distinction does not seem warranted by the observed facts. There is frequent association in *granulie froide* of tuberculous miliary granulations with bronchoalveolar miliary tubercles. Again, some authors attempt to carry the German distinctions between "productive" and "exudative" into the miliary field (DeMeyenburg, Huebschmann and Arnold, Korteweg). The German writers generally speak of disseminated finely nodular lesions where the French speak of haematogenous miliary tuberculosis. Before the Germans, Hérard, Cornil and Hanot (1888) described very clearly alveolar granulations, and Ribadeau-Dumas uses the term *granulies alveolaires*. Miliary lesions may exist in the absence of any bronchial lesions, so that the bronchial embolus mechanism does not seem to apply. It is said that patients affected with *granulie* do not spit bacilli but, even if true, this does not prove the absence of bronchial communication, usually apparent on section. The connective tissue of the lung is not sufficiently developed for a lesion to remain long separated from an air-passage. It is a question whether tuberculous granulations may not represent merely a primitive alveolar lesion affecting only a few alveoli, a perilesional sclerosis masking the original pneumonic lesion. Certainly interstitial lesions are commonly found, together with nodular lesions of a bronchopneumonic type. On macroscopic grounds, Laennec, as usual, was right, and the distinctions between tuberculous granulations and miliary tubercles are fallacious. The conception of *granulie* does not deserve the prominence it has been given. These are merely diffuse tuberculous lesions, finally nodular, but otherwise not essentially different from other lesions, and the word has no place in rational nomenclature.—*Contribution à l'etude anatomo-clinique de la tuberculose miliaire, E. Rist, J. Rolland, P. Jacob and E. Hautefeuille, Rev. d. l. Tuberc., October, 1927, viii, 625.*—(*A. P.*)

Treatment of Chronic Pulmonary Tuberculosis.—The author divides the treatment of pulmonary tuberculosis into the "essential" (rest and exercise), and the "adjuvant" (artificial pneumothorax, heliotherapy, tuberculin, etc.) methods of treatment. The adjuvant measures are merely mentioned and dismissed; while the essential methods are treated exhaustively. The treatment of pulmonary tuberculosis is comparable to the treatment of any inflammatory condition; that is, rest as the soothing or passive measure, to cause an acute or subacute condition to become a chronic condition, and exercise as an active measure to stimulate the chronic sluggish condition, thereby promoting the general and local resistance. A detailed, but tentative, standardized course of treatment by rest and exercise is given, subject to individualization according to the case. This is an attempt to definitely and minutely detail the use of rest and exercise, making them into a more or less definite course of treatment. The importance of psychotherapy is markedly stressed and dilated upon, also the value of a suitable climate and altitude. While the author does not consider climatic treatment an absolute essential, he classifies it as a fundamental. Climate is analyzed, and exhaustively investigated. In the treatment of pulmonary tuberculosis, he considers the value of rest, exercise and climate, in percentages, as follows: rest 35 per cent, exercise 40 per cent, and climate 25 per cent. —*Observations on the Treatment of Chronic Pulmonary Tuberculosis, D. Kramer, Med. J. & Rec., June 6, 1928, 614.*—(*D. K.*)

Serial X-ray Plates in Treatment of Tuberculosis.—The X-ray may be used

very advantageously as a guide to intelligent care of patients with pulmonary tuberculosis. The prognosis varies when there is cavity, tuberculous bronchopneumonia, early tuberculous fan-shaped densities, or scars in the plate. The appearance in the plate of lobular pneumonia is an indication for therapeutic pneumothorax. Basal tuberculosis has a grave prognosis. Annular shadows are usually due to thin-walled cavities. In patients showing such shadows, early sputum examination should be done. If tubercle bacilli are present, pneumothorax is induced. One can and should diagnose activity if the plate shows cavity, a recent exudate, or a spreading lesion. The report of the roentgenologist should include a prognosis. The roentgenologist should determine in serial plates the type of lesion, whether the process is spreading locally or in new parts of the lung, whether foci are breaking down with the formation of cavity, whether they are becoming more or less dense, whether the exudate is being absorbed or has disappeared, and whether scar-tissue contraction or walling-off is taking place. Depending upon these factors, exercise and rest and general management can be more intelligently looked after. If plates show extension of disease more caution in prescribing exercise is indicated. If acute symptoms develop in the absence of X-ray changes, one should look for other infections, but should also suspect miliary tuberculosis, enteritis, etc.—*The Value of an X-Ray Study in the Care of Cases Suffering from Pulmonary Tuberculosis, H. K. Dunham, Radiology, March, 1928, x, 217.*—(*H. S. W.*)

Meteorological Observations at Sanatoria.—A plea is made for the carrying out of meteorological observations at all sanatoria in Britain. By the collection of such observations a meteorological directory of British sanatoria could be published. Thus a doctor could choose the climate most suitable to his patient's needs when advising him to seek sanatorium treatment.—*Meteorological Observations at Tuberculosis Sanatoria, A. N. Robertson, Brit. J. Tuberc., April, 1928, xxii, 62.*—(*B. T. McM.*)

Tuberculin Dispensary.—The care of a patient at a tuberculin dispensary is only about one-tenth the cost of sanatorium care. In the majority of cases of simple chronic pulmonary tuberculosis (uncomplicated with mixed infections) it is not necessary for the patients to give up their work. This type of case is better treated at a tuberculin dispensary. Where other systems, such as artificial pneumothorax, may help tens, and sanatoria may help hundreds, the tuberculin dispensary system can be of service to tens, hundreds and thousands.—*The Tuberculin Dispensary, W. C. Wilkinson, Brit. J. Tuberc., April, 1928, xxii, 65.*—(*B. T. McM.*)

Exercise Tests in Pulmonary Tuberculosis.—The object of the tests was to determine how much physical exertion can be allowed with safety to patients with pulmonary tuberculosis. It is thought that graduated labor involves more risk than walking exercise. For the latter, instruction is given that no one is to walk more than a half-mile in ten minutes, and as much longer is given as is necessary to prevent discomfort, such as fatigue and dyspnoea. The following factors are worthy of consideration in estimating a patient's fitness for increased exercise: Temperature and pulse, both immediately after exercise and a half-hour later; type, condition and extent of the lesion; general condition, physique and occupation formerly followed by the patient. One hundred consecutive cases were taken who walked four miles twice daily (men) and three miles (women), and classified as satisfactory and unsatisfactory. The exercise tests of the two groups were then compared. The above amount of exercise was taken as the standard, because to reach it patients had to be in a fairly stable condition. And for this reason the tests were more reliable. Cases thought likely to respond to treatment well, and in which the ultimate prognosis seemed good, were classed as satisfactory; the others as unsatisfactory. Of the 100 cases 40 were grouped as satisfactory and 60 as unsatisfactory. The exercise tests were classified as good, intermediate and bad. *Good:* The pulse-rate falls to within 10 beats of the resting rate within five minutes of stopping exercise. No rise of temperature and no dyspnoea. *Intermediate:* The pulse-rate falls to within 10 beats of the resting rate within half an hour of stopping exercise. No rise of temperature above the normal or marked dyspnoea. *Bad:* The pulse-rate does not fall to within 10 beats of the resting rate within half an hour and there may be a rise of temperature and some dyspnoea. In the satisfactory cases the exercise test results were *good*, 13 (32.5 per cent); *intermediate*, 25 (62.5 per cent); and *bad*, 2 (5 per cent). In the unsatisfactory cases the exercise tests were *good*, 11 (18.3 per cent); *intermediate*, 19 (31.6 per cent); and *bad*, 30 (50 per cent). In 50 consecutive cases with normal temperature which were tested out the results were as follows: *Good*, 19 (38 per cent); *intermediate*, 26 (52 per cent); and *bad*, 5 (10 per cent). It was found, when

the initial pulse-rate was high and dyspnoea fairly marked because of mechanical factors, such as a large amount of pulmonary fibrosis and considerable cardiac displacement, that many of such patients do normal tests, and the pulse and respiratory rates tend to approach the normal more rapidly than is the case where such symptoms are due in large part to toxic factors. When the difficulty is only mechanical, slowly and carefully increased exercise will often secure a fall in the high initial pulse-rate. In artificial-pneumothorax cases, with satisfactory and complete collapse, similar mechanical factors are of course encountered as in cases with extensive fibrosis. Also, in such cases the pulse-rate tends to return to normal more rapidly than in toxic cases.—*Exercise Tests in Pulmonary Tuberculosis, A. Cooper, Lancet, October 27, 1928, ccxv, 859.—(H. McL. R.)*

Work-Cure in Surgical Tuberculosis.—The work-cure was first applied in England to patients suffering from pulmonary tuberculosis. This article deals with this method of treatment combined with natural heliotherapy in the treatment of surgical tuberculosis at Leysin. Disease should not be regarded as a disturbance of function of one or another organ. Disease, such as surgical tuberculosis, not only disturbs local function but the entire organism, mental as well as physical. This thought led to the idea of the work-cure. By its use the spirit or mind is treated as well as the physical body. This is necessary and vital when the period of treatment is of long duration. The tuberculosis patient is no exception to the general law that physical activity deteriorates without regular occupation. Patients who pursue a methodical course of manual work soon becomes conscious of a progressive recovery of strength, accompanied by the pleasant sensation inseparable from the carrying out of regular functioning and the adaptation of the human mechanism to a daily task. Such daily tasks have an undeniably beneficent moral or mental effect. The first step taken when patients arrive in Leysin is to replace plaster cases with simple forms of orthopaedic apparatus which, while imposing relative immobility on the diseased articulations, leave the other structures complete liberty of movement. The first application of these principles was the establishment in 1909 of the Work Colony at Leysin. Patients well on the way to complete cure were allowed to do light work, such as basket-making, light carpentry and the like, which also aided in a remunerative way, often making a longer stay possible. The next step was the establishment of the work-cure system in the military clinics at Leysin. Patients with spinal tuberculosis are made to lie on the abdomen, without casts and exposed to direct sunlight. The work-cure heliotherapy method of treatment of surgical tuberculosis has given such encouraging results that the present workshops are to be enlarged.—*The Work-Cure in Surgical Tuberculosis, A. Rollier, Brit. J. Tuberc., July, 1928, xxii, 101.—(H. McL. R.)*

Colonies for Tuberculous.—If a colony scheme is to be successful several factors must be considered. The question of the occupation of each patient before entering the colony is of the utmost importance. Another consideration is the stability of the patient in regard to the physical and, to an important extent too, the mental point of view. It is obvious that it is a waste of time and money to send an active case of pulmonary tuberculosis to a colony. All patients should have sanatorium care if possible, and, if not, home care, before being sent to a colony. Once in the colony the patient must have his hours of labor regulated according to his fitness or condition. Subsequent weekly check-ups on the physical condition of each patient is also essential. The occupation or vocational training encouraged or taught should be one that does not require much capital, and should be essentially healthy, and it should be remembered that one is naturally more proficient in a trade at which he has worked for years. Vocational training in such occupations as motor-driving and repairing, cabinet-making and rural carpentry, basket-making, and boot-repairing has been found to be of most value to the patient in earning a living and remaining in good health. Efficient training in such vocations usually requires from six months to a year and a half. Patients are paid a small amount during their training.—*Colonies for the Tuberculous, J. Johnstone, Brit. J. Tuberc., July, 1928, xxii, 113.—(H. McL. R.)*

Climatic Treatment of Tuberculosis in Alpine Resorts.—The climate at high altitudes has a general tonic effect upon the body. The cool, dry air and abundance of sunshine exert a favorable effect upon the lungs. Such climates require a certain "resistance on the part of the patient," and unfavorable results in the treatment of tuberculosis in these regions is due to lack of this. Patients should be kept very quiet and inactive for at least two weeks after arrival in order for them to become acclimatized. The food should contain a high percentage of fats. Frequently during "acclimatization" an increase in signs,

especially râles, appears; this is produced probably by an increase in depth of the respirations required in the thin air of high altitudes, by a change in bodily metabolism, etc. Fever is no contraindication to treatment at high altitudes, but patients with a persistent temperature above 101.5°F. and pulse above 120 should not be sent to the Swiss mountains. The pulse-rate and degree of fever are the best criteria as to the virulence of the infection, and the former is of especially good prognostic value. Syphilis is not uncommonly a cause of obstinate fever. Haemoptysis is no more frequently encountered in high altitudes than in the lowlands. Cough, expectoration, night-sweats and nervousness quickly disappear. Laryngeal tuberculosis heals well in the mountains, but this is not true of "abdominal" or urogenital tuberculosis. Barometric pressure affects the intrathoracic pressure in artificial pneumothorax, so that nitrogen is much more rapidly absorbed at high altitudes. Records of former patients show a remarkably high incidence of cure.—*The Treatment of Pulmonary Tuberculosis at the Swiss Alpine Resorts, Especially at Arosa, O. Amrein, J. State Med., November, 1927, xxxv, 637.*—(*H. S. W.*)

Gerson Diet in Treatment of Chronic Tuberculosis.—The results obtained by the use of the Gerson diet in tuberculosis is within the limits of the usual results obtained with the ordinary diets. There is no reason to discontinue the usual dietetic treatment.—*Die Diät nach Gerson in der Behandlung der chronischen Lungentuberkulose, H. U. Ritschel, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 394.*—(*H. J. C.*)

Treatment of Pulmonary Tuberculosis with Residual Antigen.—The paper deals with an attempt to treat tuberculosis patients by raising their specific resistance. An antigen was finally prepared which did not cause the formation of an abscess at the site of inoculation. Two antigens were used, antigen no. 3, the principal antigen, and antigen no. 1, the auxiliary antigen. The antigens are composed of human and bovine strains of *B. tuberculosis*. The preparation of the antigen is given in detail. The doses are measured on the minim scale. The antigen is given in the belly of the triceps muscle. The total number of patients treated was 98. A considerable number of these did not complete the full course of treatment and were, therefore, left out of the critical assessment. Sixty-seven patients completed the treatment. Of the 98 patients, tubercle bacilli were present in 79 per cent, night-sweats in 45 per cent, cough in 85 per cent, and loss of weight in 57 per cent. Thirty-five patients had received previous sanatorium treatment. After the completion of the treatment the patients were classified either as improved or unimproved. Two deaths occurred after five injections of the antigen. Of the 35 patients who had previous sanatorium treatment, 21 were improved, 7 failed to improve, and 7 died. This gives 60 per cent improved. Of the 32 patients who did not receive previous sanatorium treatment, 24 improved, 5 failed to improve, and 3 died, giving 75 per cent of this group as improving. Of the total 67 patients completing the course of treatment, 45 improved, 12 failed to improve, and 10 died. *Summary: 1:* It is possible to prepare a residual antigen of *B. tuberculosis* which will never cause an inoculation abscess. *2:* The immediate clinical results approach those obtained with the residual antigens of other microörganisms. *3:* Approximately two-thirds of all cases of pulmonary tuberculosis can obtain appreciable benefit from the antigen. *4:* The duration of the improvement is as yet unknown. *5:* As with every other antigen, the best results are obtained with patients that still have some powers of resistance left. If all cases are treated early or obviously hopeless cases excluded, the immediate improvement would probably exceed the two-thirds described in this paper.—*The Treatment of Pulmonary Tuberculosis with a Residual Antigen: Method of Preparation and Clinical Results Obtained, C. E. Jenkins, Brit. J. Tuberc., July, 1928, xxii, 126.*—(*H. McL. R.*)

Dreyer's Vaccine in Pulmonary Tuberculosis.—This brief article is based on a series of observations on the use of Dreyer's diaplyte vaccine in pulmonary tuberculosis. An initial dose of 1/75,000 mgm. was employed in advanced cases and as much a 1/2,000 mgm. in early disease without ill effects except that the smaller amount occasionally was followed by a marked febrile reaction. The interval was at first from five to seven days, later in each case determined by the effects produced. When a satisfactory dose was reached it was repeated several times. Patients were kept in bed as far as possible during the first two or three months of treatment. The author reports 9 cases treated in 1927. In six of these there was persistent pyrexia in spite of rest in bed, and in four of these a permanent fall of temperature to normal resulted. No good was noticed in two other bed cases. Three of the nine suffered from laryngeal tuberculosis with comparatively slight involvement of the lungs. Two of

these were markedly improved, the third only slightly. The following questions are asked: *1:* Is it right on completion of a course of tuberculin treatment to discontinue the injections suddenly, or should one withdraw the remedy gradually lest the patient should miss an accustomed stimulus? A gradual withdrawal would seem theoretically desirable. *2:* It not infrequently happens during a course of tuberculin injections, which is producing apparent benefit to the general condition and to the disease in the lungs, that a sudden attack of pleurisy intervenes and apparently undoes all the good work. The explanation is not clear. Can it be that tuberculin increases the local resistance, in the form of fibrosis, and has little or no effect on the general (humoral?) immunity of the patient, in whatever this may consist?—*A Note on the Use of Tuberculin in Pulmonary Tuberculosis with Especial Reference to Dreyer's Diaplyte, W. C. Bosanquet, Lancet, January 14, 1928, ccxiv, 75.*—(*J. S. W.*)

New Tuberculin.—*Koktoimmunogens* is prepared from a glycerine-bouillon culture of human tubercle bacilli, which have been heated for a half-hour on a water-bath and then filtered through a Silberschmidt thimble. This filtrate was injected into the right lung of guinea pigs, and several weeks later a suspension of living tubercle bacilli was injected into both lungs of the same animal. The previously treated right lung either did not become infected or proved less infected than the left nontreated lung, and, in addition, the remaining organs in the immunized animal showed less tuberculosis than the organs of similarly infected untreated control animals. The "Koktoimmunogen" treatment produced no harm in the animals thus treated, but the animals showed a greater gain in weight than normal animals. Similar tests were tried with a protein-free "Koktoimmunogen" with similar results.—*Über die immunisierende Wirkung des Koktoimmunogens von Tuberkelbacillen, R. Torikata and Y. Imamaki, Beitr. z. Klin. d. Tuberk., 1928, lxviii,* 306.—(*H. J. C.*)

Treatment of Pulmonary Tuberculosis with Lipatren.—Lipatren was used in the treatment of 49 third-stage cases, and the results were compared with 49 similar cases treated by other means. A favorable influence of lipatren could not be questioned in some of the cases, but the results were not better, as a whole, than those obtained in the cases treated by other methods, and especially with tuberculin.—*Beitrag zur Lipatrenbehandlung der Lungentuberkulose, K. von Holten, Ztschr. f. Tuberk., 1928, xlix, 428.*—(*H. J. C.*)

After-Effects of Surgical Treatment of Pulmonary Tuberculosis.—The after-results of surgical procedures in pulmonary tuberculosis depend upon the right choice of cases, the type of operation and its extent, operative mortality, complications, and after-treatment. Acute early phthisis is excluded from all major surgical procedures. The cases which are almost invariably submitted are those of chronic third-stage type. Active disease in the better lung in situations other than apical is a definite contraindication to thoracoplasty. This operation is of great value in cases which, either during pneumothorax therapy or as a result of spontaneous pneumothorax, develop fluid, which later becomes purulent. The ideal to be sought is an adequate collapse of the whole of the involved lung. This can best be obtained by performing a preliminary phrenic evulsion, and then a two-stage thoracoplasty from the first to the tenth ribs posteriorly. Thoracoplasty for tuberculosis in 59 cases resulted as follows: Alive and well, 22; alive, much improved, 10; alive, slightly improved, 2; alive, no change, 2; alive, sanatorium treatment not completed, 10; died within three weeks of operation, 4; and died later, 9. Those alive and well are patients able to carry on their occupation, varying from heavy manual to clerical work in the great majority returning to their old occupations. Those alive, much improved, consist of patients able to do light work. The slightly improved are able to get about but are unfit for work.—*After-Effects of Surgical Procedures in Cases of Pulmonary Tuberculosis, A. T. Edwards, Brit. M. J., October 6, 1928, no. 3535, 602.*—(*W. I. W.*)

Death Following Phrenic-Nerve Evulsion.—In the case here reported death followed evulsion of the phrenic nerve within six hours of the operation. The terminal phenomena suggested the possibility of excision of the vagus, but autopsy revealed an entirely different condition. A 45-year-old woman of the hypersthenic type, with an extensive exudate and cavity in the right lung, was treated with pneumothorax, but complete collapse could not be obtained because of adhesions holding the cavity out to the chest-wall. Phrenico-exairesis was resorted to under local anaesthesia. Five hours after operation dyspnoea came on, and the patient succumbed to respiratory paralysis within the hour. Maximal dilatation of the pupils and hemihydrosis of the affected side suggested a right vagus lesion. On section, thrombosis of the left femoral

vein, with a fresh thrombus in the pulmonary artery supplying the left lower lobe was found. Both vagi were intact. Embolus into left lung, with the right lung out of function because of phrenic excision, fully explains the fatal issue. The nervous symptoms, mentioned as occurring before death, deserve attention; their interpretation as representing paralysis of the parasympathetic, or stimulation of the sympathetic nerves, is not as clear as it might be. Most recent studies in the field indicate that interrelations between the vagus and cervical sympathetics are established facts, which may easily explain postoperative phenomena such as dilatation of the pupils and hemihydrosis.—*Ueber einen Todesfall nach Phrenicoexairese, W. Berg, Deutsch. med. Wchnschr., 1928, liv, 21.—(I. R.)*

Separation of Pleural Adhesions.—Adhesion of the pleural leaves, whether due to prior pneumothorax or to pleuritis coincident with pulmonary tuberculosis, is not considered an irreparable condition, and a case is reported in which, after numerous attempts to perform pneumothorax during a period of one and a half years, and during which interval a phrenic exairesis was instituted, finally a successful pneumothorax was accomplished. It is believed that the phrenic exairesis, which occasioned an elevation of the diaphragm, had a favorable influence upon the pleuritis with the result that the pneumothorax was successful.—*Einige seltene Fälle von Pleuralösung nach vorhergegangener Verwachsung, G. Haensel, Ztschr. f. Tuberk., 1928, xlix, 349.—(H. J. C.)*

Cauterization of Pleuritic Adhesions.—The author records an experience of 60 cauterizations of adhesions, and concludes that the severing of adhesions has extended the utility of pneumothorax treatment. The cauterization of small isolated bands is without danger. An increase in size of the adhesions increases the hazard, the dangers, aside from the formation of transient exudates, residing in the occurrence of haemorrhage. Two small haemorrhages are reported which were arrested by means of the cautery. A fatal case of haemorrhage from the subclavian artery is also reported. Burning of the adhesion in 38 cases resulted in freedom from bacilli in 33. In addition, the author reports 36 thoracoplasty operations, the results in the first year being improvement in 72 per cent, progression in 11 per cent, and death in 17 per cent. Freedom from bacilli was attained in 67 per cent. Over a period of 7 years' observation the results were as follows: 36 per cent able to work, 11 per cent unable to work, 22 per cent were dead, 3 per cent dead from other diseases, and the remainder, 28 per cent, still under sanatorium treatment.—*Einige Erfahrungen über Adhäremzabbrennungen und über Thorakoplastikoperationen, A. Gullbring, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 283.—(H. J. C.)*

Artificial Pneumothorax.—Roughly, it may be said that most cases of pulmonary tuberculosis can be divided into two types of disease: (1) predominantly exudative and (2) predominantly productive in character. It is claimed that the productive type is better fitted for artificial pneumothorax and promises the possibility of arrest of the disease. It is also pointed out that in the extreme productive type of long standing adhesions usually prevent satisfactory collapse. The immobilization and compression brought about with pneumothorax effects a stasis of the lymph and a lessened absorption of toxins, and the toxaemia gradually disappears. A venous stasis also results, and this aids healing. Fibrous tissue finally forms, replacing infiltrated tissue. Symptoms by this time are slight if satisfactory collapse has been obtained. The ideal case is one with unilateral disease, of fairly good general condition, preferably a young or middle-aged adult, with disease of predominantly productive character and not of too long duration, and without complications that are contraindications. Best results are obtained in cases in which disease is not so extensive. A selective collapse is often sufficient to obtain excellent results. However, Bushnell has pointed out that affected parts of the lung expand less fully because of loss in elasticity, but contain more fluid. Therefore, suction of infected lymph from the diseased area to sounder parts of the lung is likely to occur in selective collapse. This should be regarded as a real danger, and a strong argument for complete collapse of the lung whenever possible if there are no contraindications. Usually 300 or 400 cc. of air are given at the initial operation. After this, refills are given at proper intervals whenever necessary, and in amounts large enough and often enough to secure obliteration of cavities, when present, and collapse of the diseased lung when possible. Adhesions are present in the majority of cases, and, when present and actually preventing satisfactory collapse, sufficiently high pressure should be given to stretch the adhesions whenever possible, if no contraindications exist to such pressures. The lung should be kept collapsed as long as is necessary for the formation of connective or fibrous tissue replacing diseased tissue. This period is, according to Ranke, two

years. Saugman recommended the same length of time for fairly acute cases and from three to four years for chronic cases. Artificial pneumothorax should be considered the greatest achievement in the treatment of pulmonary tuberculosis since the advent of the rest-cure, and the results in carefully selected cases are gratifying and warrant its more extensive use but not abuse. In many cases it, together with rest, brings about an arrest of active and progressive disease; in others it prolongs life, alleviates symptoms and often stimulates the patient's morale.—*Artificial Pneumothorax in Pulmonary Tuberculosis, F. Neumann, M. J. & Rec., June 6, 1928, cxxvii, 601.—(H. McL. R.)*

Selection of Cases for Artificial Pneumothorax.—At some period in every far advanced case of pulmonary tuberculosis artificial pneumothorax is indicated. It is granted that the patient should be given an opportunity to show improvement or become an arrested case by the use of bed-rest, fresh air, good food, etc., before therapeutic pneumothorax is considered. An observation period of from three weeks to three months should enable the medical attendant to decide whether pneumothorax is to be advised. In the face of increasing disease no time should be lost. Also, after a longer period of rest and observation if real progress has not been made it is best to collapse the lung, if no contraindications exist. The type of case which offers the best results is perhaps the patient of young-adult age, with active unilateral disease, and without complications which contraindicate this method of treatment. Of course the most objectionable and serious contraindication to collapse therapy is active disease of the contralateral lung. And even some disease of the better lung is not to be regarded as a contraindication in all cases. This point is one always of more or less controversy, and one to be decided most wisely by the clinician of experience, and only after the closest observation and consideration of all possible factors that bear upon ultimate recovery. Active and extensive disease of the better lung, with or without cavitation, should be considered as a contraindication, but if this, even fairly extensive disease of the better lung clears up sufficiently, or if a previously present cavity ceases and disease remains extensive, active and progressive in the other lung, then artificial pneumothorax should be considered and most likely advised if there are no contraindications. Tuberculous laryngitis *per se* does contraindicate pneumothorax. Pneumothorax may be used even in the presence of valvular heart disease without disturbing the heart. However, with advanced myocardial disease and decompensation it is questionable whether artificial pneumothorax is beneficial or should be used. The presence of cavitation without contraindication should at least in the great majority of cases lead one to consider pneumothorax therapy, if not actually advise its use in all such cases. In the treatment of haemoptysis pneumothorax is particularly to be borne in mind, and here again the mistake of waiting too long is more often made than any other. However, bronchogenic spread to the contralateral lung, following haemoptysis, is fairly common, and whether or not this has occurred should be determined prior to the induction of pneumothorax. Nontuberculous abscess of the lung may be effectually treated by collapse therapy.—*The Selection of the Case for Pneumothorax, L. Schlenker, M. J. & Rec., June 20, 1928, cxxvii, 642.—(H. McL. R.)*

Refill Shock in Artificial Pneumothorax.—The refill reactions that develop in the course of artificial pneumothorax treatment are of four types: (1) general nervous reaction, (2) congestive reaction of the opposite side, (3) pleural reaction (an exacerbation of a chronic pleuritic process), and (4) "refill reaction" properly so called. This study is concerned with the last type. Its symptomatology is very characteristic. A few hours after the refill, the patient experiences a general malaise, difficult to describe, sometimes preceded by an uneasiness or tension of the insufflated side. The temperature rises briskly to 38° to 39.5°. During the night all symptoms disappear, and the patient is free from all unusual sensations in the morning. *Incidence:* At the Sanatorium Populaire de Leysin it was observed in 2 per cent of the cases. From a study of these cases the following conclusions were arrived at: *1:* The organism, which apparently is not incommoded in ordinary circumstances by artificial pneumothorax refills, can, when certain pathological conditions are present, acquire a special sensitization, which confers on it a new power of reaction. *2:* In all the cases studied there existed at the time of the reaction a serofibrinous effusion in the pneumothorax space. *3:* In all these patients an acute pleuritic attack, sometimes recurring, always preceded the state of sensitization, by varying lengths of time. This reaction is a haemoclastic crisis. It is comparable with that seen following the subcutaneous injection of pleuritic or ascitic fluid into immune or infected animals. In the hydropneumothorax cases it is not due to a reinfection but to a spontaneous reabsorption of inflammatory exudate. This absorption is prob-

ably produced by the tension put on the pleura; perhaps also it is the result of histological deficiencies of the pleura made at the time of the refill. The intensity of the reaction seems definitely in proportion to the degree of positive intrapleural pressure. At each insufflation there is an absorption of some exudate and, therefore, of foreign protein. Eventually an anaphylactic state is reached. For this specific reaction the name "*choc de remplissage*" is suggested.—*La réaction de remplissage au cours du pneumothorax artificiel, M. Gilbert, Ann. d. Méd., May, 1928, xxiii, 490.—(B. T. McM.)*

Effusions in Artificial Pneumothorax.—Effusions developing in the course of artificial pneumothorax exert a beneficial action on the disease. Effusions are less apt to develop in cases of artificial pneumothorax of long standing. Tubercle bacilli are demonstrable on direct microscopic examination in 85 per cent of these effusions; and the effusions may be divided into three categories according to their bacillary content. The number of bacilli diminish with the duration of the effusion. Following the induction of a pneumothorax occasionally a small collection of fluid may be seen in the phrenicocostal sinus. This is the normal serous lubricant of the pleura which has fallen to this position following the separation of the pleural layers by the gas. It disappears spontaneously without symptoms. The small collections of fluid that develop during the course of collapse therapy and which are usually only detected on routine examination may be due to a similar mechanism. The more copious effusions have a definite symptom-complex, and they are due to penetration of tubercle bacilli into the pleural cavity. These bacilli originate in the pulmonary lesions, but how they get into the pleural cavity is not definitely known. The rupture of superficial tubercles, infection through the lymph-stream, diapedesis, vasomotor and other mechanisms are discussed. The possible evolution of these exudates is threefold: (1) complete absorption, leaving as a residue a thickened pleura; (2) a progressive symphysis which finally obliterates the pleural cavity; and (3) the tuberculization of the pleura evolving as a caseous pleurisy or as a cold abscess of the pleura. This is a serious complication. The purulent fluid may discharge through the chest-wall; the general condition deteriorates, and perhaps there is a fatal termination; but occasionally satisfactory and durable healing takes place. The percentage of pneumothorax cases with negative sputum on discharge was greater among those who had an effusion. The mere pressure of the fluid is not sufficient to account for the improvement following the development of hydropneumothorax. The authors have seen the sputum get less and bacilli disappear, following the appearance of an exudate, even though the cavity remained unchanged on X-ray and fluoroscopic examinations. Sometimes exudates are so rich in bacilli as to appear like emulsions. In such cases the bacilli are arranged in groups, as if submitted to an agglutinating action and they appear fragmented. The progressive diminution in the number of bacilli in an exudate suggests a destructive process similar to but much slower than that seen in the experimental reinfection of the peritoneum. This slowness may be more apparent than real, as on animal inoculation the lesions resulting from such old effusions are comparatively mild and localized, and it has been observed that a pneumothorax effusion, extremely rich in bacilli, was incapable of rendering a guinea pig tuberculous. Is there some substance in these pleural fluids which prevents or inhibits growth of the bacilli? Beyond doubt the development of exudates in artificial-pneumothorax cases exerts a beneficial action on the course of the disease. These effusions are the result of an endogenous pleural reinfection and are analogous to a certain extent to the experimental allergic exudates, and they exert an inhibitory and perhaps lytic action on the bacilli.—*Les pleurésies tuberculeuses du pneumothorax artificiel. Etude pathogenique et expérimentale, E. Rist and T. Veber, Ann. d. Méd., July, 1928, xxiv, 153.—(B. T. McM.)*

Artificial Pneumothorax and Haemoptysis.—The haemostatic rôle of artificial pneumothorax is well known. That under certain circumstances it may have a haemorrhagic influence is also worthy of mention: *Haemostatic Pneumothorax: 1: True or Direct:* It may be required to put an end to an immediately menacing haemorrhage. In such cases copious insufflations are usually required, the haemoptyses sometimes not ceasing until the intrapleural pressure is positive. *2: Secondarily or Incidentally Haemostatic:* A pneumothorax, induced to arrest unilateral tuberculosis will often terminate repeated small haemoptyses. Sometimes haemoptysis will occur from the other lung, due to the activation of foci caused by increased function. *Failure of Pneumothorax to Control Haemoptysis:* This may be due to *1:* Incomplete pulmonary collapse. In such cases either surgical intervention (thoracoplasty or phrenicectomy) or the severance of adhesions by Jacobaeus's method may be indicated. *2:*

Incompressible haemorrhagic lesion. Dumarest has cited several instances. *3:* Tuberculous activity within the collapsed lung. Piguet and Giraud have shown that the collapsed lung may be the site of active foci that give rise to haemoptysis. Kindberg has seen a collapsed lung distended like a balloon by haemorrhage. *Haemorrhage Caused by Pneumothorax:* Exceptionally pneumothorax may favor rather than check haemorrhage. The traction of pleural adhesions on the site of active lesions may cause repeated haemoptysis. The withdrawal of gas may check the bleeding, or the latter may cease as the gas-pocket disappears. This complication may be only temporary, and end with the stretching or rupture of the adhesions. If it is persistent, the pneumothorax must be abandoned and collapse achieved by other methods (thoracoplasty, phrenicectomy or a combination). In one case haemoptysis occurred coincidently with pulmonary perforation. There is a possibility that a vascular focus or adhesion may have been punctured. In still another instance a fulminating haemoptysis occurred a few hours after insufflation in a ten-months' pneumothorax case. No necropsy was obtained, but there was at least the possibility of a perforation.—*Hémoptysies et pneumothorax thérapeutique. A. Falloise and E. Olbrechts, Rev. Belge d. l. Tuberc., November–December, 1927, xviii, 288.*—(*A. P.*)

Bilateral Artificial Pneumothorax.—The author reports 19 cases, 2 of them entering the hospital with pneumothorax, 12 cases treated for a long time with unilateral pneumothorax, when a progression on the other side made the second pneumothorax essential, 3 cases in which bilateral pneumothorax came into consideration on account of the severe general condition, and 2 in which it was deemed advisable on account of haemorrhage from both lungs. The results obtained were as follows: 5 of the cases were markedly improved (26 per cent), 6 improved (31 per cent), 5 unchanged (26 per cent) and 3 progressed (16 per cent). Too high a pneumothorax pressure is warned against. Decompression and selective collapse gave good results. The usual indications and contraindications are discussed. In spite of the good results obtained the author justifies bilateral pneumothorax only when all other conservative treatment, including sanatorium and climatic, has been without avail. The treatment should be instituted at first during the nonambulant stage. Ambulant treatment is only justified after a satisfactory pneumothorax has been obtained and the clinical condition warrants it.—*Zur Frage der Anwendung des doppelseitigen Pneumothorax bei der Behandlung der Lungentuberkulose, J. A. Kerzmann, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 271.*—(*H. J. C.*)

Bilateral Pneumothorax in Child.—A girl of infantile aspect and in poor general condition and nutrition, with flat "paralytic" thorax, was admitted to the Sanatorium Edith Cavell at Obourg, Belgium, September 1, 1926. Appetite and digestion were impaired. She had moderate cough, worse at night, sleep disturbed by frequent micturition, bacillary sputum, strongly positive cutireaction and subnormal temperature. Clinical examination showed a deep-seated soft lesion of the right apex and a focus at the base, and on the left a few distant apical râles were audible. Fluoroscopy showed an opaque shadow in the right sternoclavicular angle and considerable clouding in the axillary region; also a similar area on the left. Initial improvement was followed by a febrile attack, with fulminating activity in the right lung, the left having meanwhile become almost normal; and a right-sided pneumothorax was induced in March, 1927, with almost complete collapse of the upper and middle lobes. Nevertheless, treatment was ineffective, and there was evident reactivation of the lesions on the left. On May 10 the child suddenly presented an anxious and dyspnoeic appearance. Pleural puncture induced coughing, and no information was yielded. The following day dyspnoea was extreme, and respirations were short and superficial, and 64 per minute. Respiratory sounds on the left were enfeebled, and fluoroscopy showed an incomplete pneumothorax. From the right side 300 cc. of gas were removed with marked benefit. How did this second pneumothorax occur? It is possible that her severe coughing was responsible for the rupture. In any event, both bases soon expanded sufficiently to assure haematosis, and later a little exudate appeared in the pneumothorax spaces on both sides. *Causes of Perforations:* The compensatory emphysema which occurs in the uncollapsed parts of the lungs is thought to favor perforation by being unusually fragile. If this fragile lung tissue is pierced by the needle or trocar, it may readily rupture. This theory is opposed to that of Chabaud, who speaks of the harmlessness of puncturing sound lung. Careful fluoroscopic control is recommended to anyone wishing to practise bilateral pneumothorax.—*La collapsothérapie bilatérale: essai d'explication de la plus grande fréquence des perforations pulmonaires au cours du deuxième pneumothorax,*

André and De Looze, Rev. Belge d. l. Tuberc., January–February, 1928, xix, 26.—(A. P.)

Physical and Biological Problems in Heliotherapy.—A study has been made of the spectral energy characteristics of the mercury-vapor lamp. A vacuum-type burner, run at 110 volts A.C., was used in all investigations. Measurements of the variation of the relative intensity of the lines, 3130, 3022, 2967, 2897, 2804, 2650, and 2536 ängstroms under varying conditions of age of burner and operation, are reported. The ultraviolet emission has also been measured by a cadmium photoelectric cell in uviol glass, by the starch iodine test, and by the skin erythema. It may be concluded from these investigations that the cadmium cell gives a satisfactory reading of the erythema-producing ultraviolet part of the mercury-vapor spectrum. A method is proposed by which the calibration of a photoelectric cell in absolute units can be carried out. This permits checking the sensitiveness of an individual cell and calibrating other cadmium cells in the same units. The correlation between this absolute unit and the biological effect (skin erythema) has been established.—*Physical and Biological Problems in Heliotherapy, E. A. Pohle and R. A. Sawyer, Am. J. Roentgenol. & Rad. Ther., October, 1928, xx, 338.—(W. I. W.)*

Heliotherapy in Surgical Tuberculosis.—The functions of the skin are numerous and have to do with respiration, elimination, circulation, internal secretion, immunization, innervation, etc. Heliotherapy produces a more regular flow of blood from the depths to the surface, and thus leads to decongestion. Pigmented skins are refractory to several skin diseases. Insolation of the entire body rather than of the local part affected by the disease is advisable for this reason and also for its tonic effect upon the subjacent musculature, which often becomes remarkably developed during the insolation of bedridden patients. It leads to recalcification of bone. Heliotherapy exerts a helpful influence upon the psyche. It must be administered judiciously and individually, and should be employed along with graduated physical work, regular diet and rest, and a good orthopaedic rationale and appliances. If used properly it may replace surgical procedures in all tuberculosis except that of the kidney, and this only because as a rule the diagnosis comes but late in the course of the disease.—*The Therapeutics, Preventive and Social Value of Heliotherapy in Surgical Tuberculosis, A. Rollier, J. State Med., Aug. 1928, xxxvi, 435.—(H. S. W.)*

Artificial-Light Treatment of Tuberculosis.—Artificial-light treatment has a specific effect in the treatment of superficial forms of tuberculosis, such as (1) lupus vulgaris and scrofuloderma and (2) tuberculous adenitis with softening, and with or without associated cutaneous infiltration. The evidence is not conclusive that light treatment exercises a specific effect on the deeper nonpulmonary tuberculous lesions, although many patients with such lesions have, as a matter of fact, been treated to a successful conclusion at the dispensaries with artificial light alone. So far as improvement in general condition, as evidenced by gain in weight, is concerned, patients vary very widely in their response to light treatment, and, although a patient may fail to improve in general condition to any marked extent, it does not follow that the tuberculous lesion will not improve. Marked gain in weight has been a feature in some of the arrested cases, but many gained little or remained stationary. On the whole, pigmentation has been associated with improvement in general condition, and the nonpigmenters have not improved to quite the same extent. General irradiation is the most important part of the treatment, and local treatment, when used, is subsidiary. General irradiation should, therefore, always be given unless there are special reasons why it is inadvisable. It has been demonstrated that the presence of a pulmonary lesion in a combined case of pulmonary and nonpulmonary tuberculosis with normal temperature does not contraindicate general irradiation, although such is naturally given with extra care. Five cases of active pulmonary tuberculosis with positive sputum have been treated without satisfactory results. Of the 215 cases becoming quiescent and apparently cured at the three light centres, only two (one lupus vulgaris and one Bazin's disease) had a recurrence up to the end of 1927. It is essential for the temperature to be taken before any patient receives light treatment, in order that no febrile patient be given treatment (the maximum temperature adopted has been 100°F.). From experience with several hundreds of cases, the temperature, after varying periods of general irradiation, has exceeded 100°F. in one case. It has now been found necessary at the Ashton-under-Lyne, Lancaster, and Chorley centres to take the temperature of patients after light treatment as a routine matter for any condition other than a lesion or suspected lesion in the chest. No patient has had any permanent ill-effect, either local or general, at any of the dispensary light centers.—*Artificial Light Treatment at Tuberculosis Dispensaries in the Adminis-*

trative County of Lancaster, A. D. Brunwin, G. L. Cox and J. L. Stewart, Tubercle, October, 1928, x, 1.—(W. I. W.)

Artificial Light-Treatment of Pulmonary Tuberculosis.—It is generally taught that ultraviolet radiation is contraindicated in pulmonary tuberculosis and is dangerous. By adjusting the source of light at a proper distance and avoiding erythema the danger of congestive phenomena can be avoided. At the Military Sanatorium of Marchin 170 patients have been exposed without harm. At first those patients were selected whose condition seemed stationary and not benefited by the hygienic-dietetic cure. Then pleuropulmonary and pneumothorax cases were added, and finally all patients. If 44 recently begun cases are omitted, there remain 129, of which 79, or 61.2 per cent, are improved, 21, or 16.3 per cent worse, and 29, or 22.5 per cent, in *statu quo*. The insolations are begun with three minutes, and are increased by three minutes each time, up to thirty minutes for each side. After 20 sittings there is a rest for two weeks, and then exposures are again begun at five minutes and increased by the same period up to a half-hour. The decubitus position is preferable. Pneumothorax patients seem more sensitive and are liable to pleural reactions. The results reported are based not merely on clinical impressions but on physical examination, weight, and erythrocyte sedimentation, the latter regarded as a more delicate index than the thermometer. The ultraviolet rays should be considered as an adjuvant rather than a direct curative agent. Erythema and burns should be avoided. Many patients feel a sense of well-being and are put in a better humor. Metastatic lesions may be cured. Purulent fistulized pleurisies are especially benefited. For large-scale work 4 or 5 lamps are required, with perfect aëration to remove the nitrous vapors. It is reaffirmed that pulmonary tuberculosis is no contraindication to properly carried out actinotherapy and the latter is a partial corrective of an unfavorable climate.—*L'héliothérapie artificielle en tuberculose pulmonaire, Dumont, Rev. Belge d. l. Tuberc., September-October, 1927, xviii, 240.—(A. P.)*

Ultraviolet Light in Otorhinolaryngology.—*Historical:* In 1913 Nepveu described an arc-lamp, its rays concentrated by a quartz lens, which he advised for the treatment of tuberculous laryngitis, chronic atonic otorrhoea and tuberculous ulceration of the nasal septum and palate. In 1924 Leprince used a quartz electrode in the form of a laryngeal mirror, ultraviolet rays being produced by a high-frequency current, with favorable effects on tuberculous laryngitis. In 1925 Bergis of Salonika applied radiation with success to atonic postoperative mastoid wounds, tuberculous otitis media, ozaena, and tuberculous laryngitis. He used a mercury-vapor lamp and Claoné's direct laryngoscope. In 1925 Legourt used Hanau's lamp and an ordinary glass laryngeal mirror, which was a mistake, as it arrests ultraviolet rays. In the same year Wessely, of Vienna, published an important work on artificial heliotherapy of the larynx, with a review of the literature. *Introductory Discussion:* Irradiation of the cavities of the body is a more delicate and complicated procedure than the body's general irradiation. Applicators which will go directly into the cavities are preferable. Since Nogier, of Lyons, devised quartz electrodes, in 1911, such applicators are obtainable, and a high-frequency current is used. The rays can impinge directly upon the treated surface, and the short distance greatly increases the effectiveness and lowers the time of application. The ozonization of the air has itself a bactericidal effect. External and internal applications are distinguished, the latter being preferred. *Work of Wessely:* He used arc-lamps, the carbons being impregnated with metallic salts, applied externally, either (1) directly, using Seiffert's suspension laryngoscopy, with cocaine-adrenalin anaesthesia, the irradiation lasting 7 to 10 minutes, or (2) indirectly, by the employment of a special metallic laryngeal mirror, held in the mouth by a special support. This mirror reflects only the longest ultraviolet rays. The sittings consume 10 to 30 minutes. After a ten-minute exposure the epithelium of the mucosa peels off, and the surface is covered with a grayish-yellow fibrinous layer. This local reaction does not bother the patient. First the lesions become less painful; then the tuberculous infiltration disappears; and ulcerations cease to extend and become cicatrized. Sometimes even the vocal cord regenerates. The larynx heals less quickly than the mouth, tongue or pharynx. Prolongation of the treatment avoids recurrences. Wessely, among 168 cases of tuberculous laryngitis, obtained 28 per cent of cures and 20 per cent of ameliorations, while 26 per cent more were relieved of pain though their lesions were not improved. Vegetative forms are most favorable. Febrile patients can be satisfactorily treated. *Work at the Brugmann Hospital:* The *external method* was first used, and Hanau's lamp. The external indirect method is applied by means of special metallic mirrors (silver, stainless steel), while the direct method requires

Killian's suspension or Claoné's nonsuspension laryngoscope. The latter has recently been favored, together with Clar's mirror. The subject goes without breakfast or takes only a glass of milk. Every quarter-hour prior to application he takes a tablespoonful of an antispasmodic potion containing 1 grain of opium per 2 drams. A quarter-hour prior to application the pharynx and larynx are painted with 20 per cent cocaine. At the application the patient is seated, the head protected by a blue mask, and the laryngoscope is introduced. Six cases have been thus treated, of whom one died and four ceased treatment because it was too taxing. The sixth case is practically cured and has resumed work. He had bilateral apical sclerosis, with a small focus of softening on the right, where there were a few râles, and was emaciated and had coughed for three years, with hoarseness for one year. Laryngoscopy showed bilateral tuberculous corditis, with oedema of the arytenoids and ventricular bands. The patient tolerated the external direct method very well, receiving five minutes' radiation three times a week. The infiltration of the ventricular bands and arytenoids persisted, but the hoarseness was markedly improved, the patient gained 1 kgm. in weight and resumed work. It is concluded (1) that treatment of tuberculous laryngitis by ultraviolet radiation, using the external direct method, relieves dysphagia and laryngeal pain; (2) that the torpid and less-advanced cases of pulmonary tuberculosis should be selected and that there is no harmful influence on the pulmonary disease, and (3) that the external direct method is surer than the indirect. When the epiglottis is involved it is inapplicable. *Internal Method:* In 1924 Leprince used a quartz electrode, with a laryngeal mirror constructed by Gallois of Lyons, and a high-frequency current. The electrode was placed only about 4 cm. from the vocal cords and 8 cm. from the internal orifice of the larynx. In 1927 Heyninx devised intralaryngeal electrodes to reach the lesions more closely. These, as constructed by Gallois, emit ultraviolet rays up to a wave-length of 2377 mμ, and one to two minutes' application is sufficient. One of these is also used to treat middle-ear tuberculosis with perforation and chronic otorrhoea after cocainizing the auditory canal. A slight auricular itching is followed by congestion and a serous discharge which ceases after about a day. Several applications are necessary. When there is caries of bone the method is of little use. The same electrode is used to treat tuberculosis of the nasal fossa, involving either the septum or the ethmoid. After each application there is a sense of dryness, followed by an abundant serous discharge. The next day the mucosa appears moist and brilliant, and then dries. Little tubercles near the anteroinferior angle of the septum heal remarkably quickly. For tuberculosis of the mouth a buccopharyngeal electrode is used. The patient goes without breakfast, or takes only milk, and receives, every quarter-hour, the antispasmodic potion referred to, prior to cocainization. Irradiation is given two minutes twice a week. After each sitting his throat feels dry; then he is relieved of pain and swallowing becomes painless unless there is oedema of the epiglottis and vestibule. The next day the mucosa is moist and brilliant, and miliary tubercles can sometimes be distinguished. This is followed by dryness and desquamation, and after a few applications amelioration is continuous. Tuberculosis of the endolarynx is treated by either of two specially designed electrodes, after the careful application of 20 per cent cocaine, with the patient sitting, the instrument being introduced under digital control. The same sort of local reaction occurs, followed by desquamation. It seems likely that better and more rapid results will accrue with this than with the external method. Great encouragement is offered for the treatment of all local manifestations of tuberculosis of the upper respiratory tract.—*Les applications diniques des rayons ultra-violets en oto-rhino-laryngologie, A. Heyninx and G. Frix, Rev. Belge d. l. Tuberc., November–December, 1927, xviii, 279.*—(*A. P.*)

Action of Ultraviolet Rays on Skin.—The irradiation of the skin with ultraviolet rays produces a series of photobiological and photochemical changes. The histological examination of the changes in the skin following irradiation indicates alteration in the epidermis and capillary circulation. About an hour after irradiation of the skin there is marked dilatation of the capillaries, which are engorged with blood cells, followed later by the exudation of plasma and the production of a fibrinous exudate in the intracutaneous tissue. Polymorphonuclear cells aggregate in the capillaries; the endothelial cells are smaller and enlarged. Diapedesis of the polymorphnonuclear cells occurs; these cells wander into the intracutaneous layers and finally aggregate amid the whole structure of the skin. The changes in the capillaries and the blocking of their lumina with leucocytes may produce damage sufficiently intense to cause death by intravascular thrombi and embolic infarction of blood-vessels in the vicinity of vital organs. The extensive necrosis and gangrene of the skin can be attributed also

to circulatory disturbances. Even the minimal erythema dose of light increases the bactericidal power of the blood. The maximum effect is obtained by irradiation of about 20 to 30 square cm. of skin per kgm. body weight. This bactericidal action originates at the site of irradiation, and is carried by the blood-stream into the general circulation. A bactericidal substance has never been isolated from extracts of irradiated skin. It is still unknown what the bactericidal response of the blood is due to. Several theories are advanced and discussed. Cooling of the skin and the use of compression causes a deeper and more intense reaction, due to the greater depth of penetration of the rays. Ultraviolet rays also produce a local bactericidal response. This may explain the beneficial action of the local irradiation of lupus. The present conception of the action of ultraviolet rays on the skin supports the theory of the production of (1) local photobiochemical substances which have bactericidal or vitamine properties, (2) local hyperaemia of the skin, and (3) stimulation of a leucocytic infiltration of the epidermal tissues.—*The Action of Ultraviolet Rays on the Skin, A. Eidinow, Brit. J. Tuberc., July, 1928, xxii, 136.—(H. McL. R.)*

Ultraviolet Rays in Tuberculosis of Infants.—The difficulty of obtaining sunshine in anything like sufficient purity is emphasized. This applies particularly to cities, whose hazy atmosphere so filters out the ultraviolet rays that the incidental exposure to heat and wind is hardly warranted. Natural heliotherapy has given good results in infantile tuberculosis, in spite of its drawbacks. Quartz light treatment, however, has met with such conspicuous success that it should not be withheld from any tuberculous infant. No matter how extensive the lesions, nor how grave the general condition, the treatment was applied to the author's cases, with such benefit as could hardly have been obtained by any other means. The cases were pulmonary as well as "surgical." In spite of the great gravity of the former condition, gain in weight, disappearance of fever, improvement in the general condition, return of appetite, cessation of cough, and cicatrization of lesions frequently followed the treatment. Cases of cervical adenitis, even with suppuration and sinus-formation, responded to ultraviolet radiation when other agencies had failed. The same thing was true of all forms of tuberculous peritonitis, in which the rays were found far superior to laparotomy. Even withdrawal of ascitic liquid by tapping was not found necessary, except in cases in which pressure became very uncomfortable. Tuberculous osteitis and arthritis responded to quartz-light treatment much better than to surgery. In tuberculosis of the skin, surprisingly good results have been obtained. As for pulmonary tuberculosis, whose prognosis in early infancy is so fatal, a case of a baby two months old is presented as an example of the remarkable results of ultraviolet therapy. Tuberculous bronchopneumonia involved both lungs. The tuberculin test was strongly positive. Tubercle bacilli were not found. The general condition improved markedly. The X-rays showed pulmonary arrest by fibrosis, with some residual involvement of the tracheobronchial lymph nodes. The prognosis was thus changed from fatal to good. The use of irradiated foodstuffs is commended.—*Les rayons ultraviolets dans la tuberculose de l'enfance, M. G. Alvarez, Arch. d. Méd. d. Enf., August, 1928, xxxi, 466.—(P. J. W.)*

Benefits of Vita Glass.—This product is now being used in many sanatoria in England. A biological test of the effect of glass on the health of human beings was carried out in a school. Two classes of thirty boys each were taught during a period of nine months in classrooms glazed with ordinary glass and Vita glass, respectively. The general health of the boys in the Vita-glass rooms showed a definite improvement as compared with those in the other class.—*The Rôle of Glass in Relation to Light Treatment, F. E. Lamplough, Brit. J. Tuberc., April, 1928, xxii, 4.—(B. T. McM.)*

Effect of Irradiation on Blood Chemistry.—Most investigations of the effect of irradiation on the blood have taken into account the effect upon changes of calcium and phosphorus together. The fact that calcium metabolism depends much more upon the ionized state o the element and the balance between the different forms than the total amount present has often been lost sight of. This investigation showed little quantitative change in calcium. In several cases of pulmonary tuberculosis irradiation was associated with a steady rise in the cholesterol of the blood. One case which did badly showed a definite drop in the cholesterol, although the calcium and phosphorus remained unchanged.—*Effect of Irradiation on the Blood Chemistry in Tuberculosis, K. C. Spence, Brit. Jour. Actinother., November, 1928, iii, 148.—(H. S. W.)*

Effect of Light on Leucocytes.—In an attempt to follow the changes shown

by certain leucocytes in tissue cultures of mammalian blood cells, work was greatly hindered by the exceedingly rapid and extreme degeneration of all types of leucocytes in the cultures. These cultures were made from the buffy coat of the clot from cat, guinea-pig and rabbit blood. This degeneration was found when the cells were planted in any of the culture media tried, some of which were autogenous heparin plasma, autogenous plasma, autogenous serum, Tyrode solution, and mixtures of these with embryo juice. The specific cell changes in general were as follows: Following a latent period, during which no change could be observed in the cell, there was a period of stimulation during which the motion of the cell was greatly accelerated. This stage has been observed in all cells except the lymphocyte, in which it may possibly occur to a slight degree. Finally, there was the terminal stage, the stage of degeneration, in which the cell rounded up, lost its motility, and either became badly swollen or else underwent a more or less complete coagulation. It is evident that the degeneration must have been caused by some factor intimately associated with the process of examination. The elimination of the use of immersion oil and of unnecessary handling and the proper adjustment of the temperature of the microscope hot-box did not materially affect the number of degenerated cultures. The elimination of these factors, together with the data concerning the distribution of degeneration through any one series of cultures, strongly indicated that the action of light, ultraviolet, visible or infrared, either from the surrounding day ight or from the microscope lamp itself, was the most probable agent in causing the degeneration. This was found to be the case after further tests were done, in which the cultures were made and handled in the dark or in as dim a light as possible. The exposure of the culture to the microscope light (6-volt, 108-watt, with daylight glass and water cell) seemed to be the chief factor in causing the degeneration. By a reduction of the infrared part of the spectrum, it was shown that the effect was not due to a heat coagulation of the cells. This degeneration was also found to occur in the complete absence of ultraviolet wave-lengths. Further, it was shown that this degeneration was caused by light which lay within each of the three wave-length zones (1) 430 $\mu\mu$ to 550 $\mu\mu$; infrared: (2) 475 $\mu\mu$ to 630 $\mu\mu$; 690 $\mu\mu$ to infrared: (3) 600 $\mu\mu$ to infrared. No indication was given as to whether all the regions of these zones, which were obtained with various Wratten light filters, were active in causing the degeneration, or whether the active rays are limited to certain wave-length bands lying within these zones. This degeneration of the leucocytes under the action of light was also found to occur upon irradiation of hanging drops of whole blood. This is interpreted as showing conclusively that the degeneration was not dependent on certain factors incident to the preparation of the tissue blood-cultures such as centrifugation, lowering of temperature, or the presence of abnormal saline solution. It was noted, however, that the leucocytes in hanging-drop cultures required a markedly longer time for their degeneration under the action of light than did the leucocytes in cultures prepared from the buffy coat and inoculated into serum. This is considered as possibly due either to injury to the cell during centrifugation and subsequent handling in making the cell cultures, or to some action of the red blood cells present in large amounts in the hanging drops of whole blood. In these hanging-drop cultures of whole blood, degeneration of the leucocytes was also found to occur when the light reaching the culture was first freed from the lower part of its infrared and from all of its ultraviolet. In considering what relation the degeneration of leucocytes *in vitro*, under the action of light, may bear to the action of light on these cells *in vivo*, the conditions in the two instances are so dissimilar that comparison is difficult with our present data. It is significant, however, that some investigators have noticed under irradiation a drop in the total white count and a destruction of white cells.—*Studies upon the Effect of Light on Blood and Tissue Cells. I. The Action of Light on White Blood Cells in Vitro (with plates), W. R. Earle, J. Exper. Med., October 1, 1928, xlviii, 457.—(J. S. W.)*

Effect of Light on Red Blood Cells.—It was previously shown that leucocytes, in tissue and hanging-drop cultures, when exposed to the action of light, undergo rapid and extreme degeneration. It was also found that red blood cells, when exposed to light, undergo degenerative changes, the cell swelling and finally undergoing haemolysis, whereas in cultures kept in the dark the cells remained unchanged. The present article has to do with the red-cell degeneration. Observations were made on hanging drops of blood obtained from rabbits. In the irradiation of these cultures the same light source and optical system used in the analogous work on leucocytes were employed. In some instances washed red cells, suspended in Locke's solution, were used for making the hanging-drop cultures. On exposing the red cells to light there was a preliminary period of fifteen to thirty

minutes during which no effect was noted; following this there was a period during which the cells swelled and became, first, almost biplanar, then biconvex, and finally spherical. After a spherical shape had been assumed the liberation of pigment from the cells began. This process progressed with varied rapidity, sometimes being very slow and incomplete, and sometimes of almost explosive rapidity. This liberation was not accomplished in either case through a gross rupture of the cells but through the agency of some submicroscopic change produced either in the cell contents, the cell wall or both. Following this liberation of pigment, in some cultures the red cells showed signs of coagulation, as did the white cells. In other cultures, however, the red cells were reduced to colorless shadows. When whole blood was diluted with unbuffered Locke's solution and then irradiated in hanging-drop preparations, all the red cells haemolyzed, one or two at a time, the haemolyzed cells being left as achromatic shadows. This haemolysis of the red cells occurred upon irradiation of the culture with white light, or with light lying in each of the three spectral zones of the visual spectrum defined by the Wratten filters used in the experiments described previously. Within the range of intensities of light employed, there was little or no difference in the rate at which the light of these three regions acted on the red cells. Furthermore, this rate was the same as was the rate when the red cells were irradiated with direct light, or when a 5 per cent total transmission neutral filter was interposed. It was shown that this degeneration of the red cells under the action of light was not dependent on the presence or absence of serum, with the possible exception of that trace which might have been adherent to the red cells even after repeated washing. The white cells in the culture showed no changes until after traces of red-cell pigment could be seen free in the surrounding medium. No neutrophiles were observed moving around for longer than a few minutes after the liberation of red-cell pigment had occurred. The liberation of substances from the red cells, as a result of irradiation of such preparations, may play some major rôle in the degeneration of irradiated white cells.—*Studies upon the Effect of Light on Blood and Tissue Cells. II. The Action of Light on Erythrocytes in Vitro*, *W. R. Earle, J. Exper. Med., November 1, 1923, xlviii, 667.*—(*J. S. W.*)

Effect of Light on Fibroblasts.—The results obtained from a series of observations on the effect of light on leucocytes and erythrocytes suggest that substances liberated from the erythrocytes, during their degeneration under the influence of light, play some rôle in the degeneration of the leucocytes when exposed to light. As it was found impossible to obtain leucocytes free from erythrocytes, fibroblasts were used instead, and these cells were found to be fairly satisfactory for further investigation. The fibroblasts used were obtained from the hearts of embryo chicks of from six to twelve days' incubation. Fragments of the tissue on cover-glasses were covered with a drop of Tyrode solution, and each cover-glass was then inverted over the well of a hollow-ground slide and its edges sealed. The cultures were incubated at 38°C. until the fibroblasts had moved out on the cover-slip in a sheet of same size. This required from ten to sixty hours. At the end of this time the cultures were divided into two groups; one group was irradiated, while the other was kept in the dark incubator as a control. The light source and optical system were the same as those described previously. In all experiments irradiation and microscopic examination of the cultures were carried out simultaneously. In order to secure cultures of fibroblasts under conditions as similar as possible to those under which the leucocytes degenerated it was necessary that red blood cells be present in the medium. These were obtained by puncture, with a capillary pipette, of one of the extra embryonic blood-vessels of the embryo chick, and were washed in Tyrode solution, and a few cells added to each of a series of cultures. As with the other cultures, the whole process was carried out aseptically in a very dim light. In the presence of autogenous red blood cells the fibroblasts underwent a rapid degeneration when exposed to the light of the visual spectrum. In this degeneration, the cells showed a marked increase in refractive index, and a massive formation of colorless vacuoles of low refractive index. These vacuoles gave no reaction with osmic acid or Sudan-III, but took up neutral-red. In some cases this degeneration process was modified in such a manner that, instead of the formation of vacuoles, the whole cytoplasm became much less viscid and the cells swelled greatly and became spherical. Degeneration usually was complete in from one to three hours. Degeneration of the fibroblasts occurred when the cells were irradiated by light filtered through various Wratten filters. This degeneration was much slower for the cells irradiated through the blue or red filters of less than 5 per cent, and less than 6.6 per cent, respective total transmissions. When irradiated through the green filter of 23 per cent total transmis-

sion, it was much more rapid, and even more rapid than for cultures irradiated with white light of 100 per cent total transmission. These data were obtained on a short series of cultures and must be considered only as suggestive. In the apparent absence of red cells, the fibroblasts underwent only a slight degree of degeneration after irradiation lasting from thirteen to twenty-four and one-half hours. It is possible that even this minor degeneration may depend upon the presence of traces of disintegrated products of red cells in the culture. Much more advanced degenerative processes were obtained, when many red cells were present, after only three hours' irradiation. Certainly any action of light of the visual spectrum on the fibroblasts alone was exceedingly slight, its major influence being conditioned by the presence or absence of red blood cells.—*Studies of the Effect of Light on Blood and Tissue Cells. III. The Action of Light on Fibroblasts in Vitro (with one plate), W. R. Earle, J. Exper. Med., November 1, 1928, xlviii, 683.*—(*J. S. W.*)

Influence of Light on Rabbits.—From previous observations made by the author on normal rabbits it was found that nutrition and growth, and growth of hair, may be influenced by living in an environment of neon light, in the dark, or in an environment of diffuse, filtered sunlight of varying intensity, and that the effects produced by these conditions depend to some extent upon the color of the animal. When the above observations had been completed, the animals were killed and their organs weighed for the purpose of determining whether any difference in the organic constitution of the several groups of animals could be detected, and whether a relation could be established between physical and functional states presented by animals living under different environmental conditions. The results of this phase of the experiments are reported in the present paper. The findings are based on an analysis of the organ weights of 3 groups of normal rabbits. Each of the groups contained 15 animals, 5 of which had been living in an environment of neon light, 5 in the dark, and 5 received diffuse, filtered sunlight of varying intensity. Group 1 was composed of white, group 2 of black, and group 3 of gray, brown and black animals. The animals in groups 1 and 2 were placed in their respective environmental conditions for a period of approximately seven months. Group-3 animals were so placed that the light and dark divisions of this group were interchanged, the animals which had been living in an environment of neon light for approximately four months being placed later in the dark for four months and *vice versa*. After four months the two divisions were restored to their original environment before killing. The organs were weighed, and the given weights compared with the standard mean weight for that organ which is the mean value obtained from an examination of 645 animals of similar weight. Differences between the values obtained in these experiments and the standard values for normal rabbits are recorded in many tables and graphs as percentage deviations. It was found that the values obtained for light, dark, and control animals tend to preserve a common relation to the standard values, irrespective of differences in environmental conditions. It is evident, therefore, that the results are affected by the action of some factor which influences the weights of organs of all animals in a given matter, but not necessarily to the same degree. It is difficult to correlate the size or weight of a given organ with a particular state of functional activity. Yet there is sufficient evidence to warrant the conclusion that in these experiments there is a relation between the results obtained for organ weights on the one hand, and for increase in body weight and the growth of hair on the other. The light produced an effect on the physical constitution of the rabbits which was comparable to the effects produced on the functional activity of the same animals.—*Influence of Light Environment on the Organic Constitution of Normal Rabbits with Especial Reference to the Action of Neon Light, W. H. Brown, J. Exper. Med., October 1, 1928, xlviii, 567.*—(*J. S. W.*)

Benzyl Cinnamic Ester in Tuberculosis.—It is claimed, as a result of Jacobson's researches on the properties of the two radicles, the cinnamic and the benzyl, which together constitute benzyl cinnamic ester, that the cinnamic radicle hinders the growth in culture of tubercle bacilli, diminishes the febrile reaction which occurs in a guinea pig after the injection of tuberculin, and produces a leucocytosis after its subcutaneous administration. It is also claimed that benzyl cinnamic ester has given good results when used in the treatment of lupus, lymphatic tuberculosis, genitourinary tuberculosis, and buccal and laryngeal tuberculosis. Some review of the literature is made, and the following are quoted as having obtained favorable results in such tuberculous conditions as mentioned above: Jacobson, Darier, Jeanselme, Mitchitch, Froissard, Cathelin, Brulé and many others. Jacobson has also reported 10 cases of pulmonary tuberculosis treated with benzyl cinnamic ester. Favorable symptomatic improvement is claimed

as well as improvement in the pulmonary lesions as shown by X-ray. *Technique:* The treatment consists of a course of 12 daily intramuscular injections followed by a rest of fifteen days, after which the course is repeated twice until three such series are given. Two months are allowed to elapse before resuming treatment in the same manner. The dose varies from 0.25 to 1.0 cc. No reaction follows the administration of the product. Fifteen cases are mentioned as having been treated by this method, three of which are taken as typical and are reported in detail. There is no mention made of any control cases. *Case 1:* Pulmonary tuberculosis complicated by lymph-node tuberculosis with a discharging cervical sinus. Very marked general and local improvement is claimed after the usual method of treatment. *Case 2:* The patient had tuberculosis of the kidneys with cystitis; he had been ill for two years. Patient said to have improved after the use of benzyl cinnamic ester. *Case 3:* Patient had pulmonary and laryngeal tuberculosis. The patient improved following the administration of benzyl cinnamic ester. None of the cases were under treatment and observation for more than three months.—*Benzyl Cinnamic Ester in Tuberculosis, H. Gainsborough, Lancet, May 5, 1928, ccxiv, 908.*—(*H. McL. R.*)

Allonal in Pulmonary Tuberculosis.—Allonal is a saltlike compound of allylisoprophylbarbituric acid and phenyldimethylaminopyrazolon. This drug was used in the symptomatic treatment of 50 patients with pulmonary tuberculosis. The results were satisfactory, inasmuch as it suppressed cough, depressed the temperature, and reduced sweating. At the same time it has a slight and agreeable soporific effect.—*Allional zur symptomatischen Behandlung bei der Lungenphthise, E. Giegler, Klin. Wchnschr., September 23, 1928, vii, 1891.*—(*M. P.*)

Calcium-Parathyroid Treatment of Tuberculosis.—Several patients with pulmonary tuberculosis showed marked improvement in their general condition under calcium or parathyroid therapy. With this form of treatment the calcium content of the blood can be raised from a minimum (9 to 11 mgm. per 100 cc.) to a maximum.—*Co-Relation of Calcium Metabolism Parathyroid Function and Pulmonary Tuberculosis, P. Ellman, Tubercle, January, 1928, ix, 162.*—(*W. I. W.*)

Treatment of Tuberculosis with Sanocrysin.—Moellgaard's and Madsen and Moerch's experimental studies have shown the importance of the dosage of sanocrysin in experimental tuberculosis. As far as possible, treatment should always be started with large doses, about 1 cgm. per kilo bodyweight, that is, about 0.5 gm. per patient. In the vast majority of patients this amount will not cause a reaction. The dose should not be increased before the last injection is borne without reaction. The reactions, such as fever and skin eruptions, are manifestations of the specific toxins liberated by the treatment. Of 111 patients treated since 1926, 64 are reported as "healthy," 29 improved, 18 unchanged. The 64 "healthy" ones include only 7 patients with bacilliferous sputum, 28 pulmonary patients with negative sputum, 24 with pleuritis, 4 with lymph-node tuberculosis, and one child (without diagnosis) under 15 years of age. The 18 "unchanged" patients are represented as "most severe cases." If the treatment can be started at an early stage, before connective tissue has been formed, it is curative; later it is only palliative. The results of treatment are particularly satisfactory in pleuritis. It is claimed that all unsatisfactory results reported in the literature are caused by improper, usually too small, dosage. All patients who had been treated before January 1, 1927, and who had been designated as cured, were reëxamined as far as they could be traced. Leaving out all patients who were not available for reexamination, the frequency of relapse was as follows: of 4 "light cases with bacilli," 1; of 11 "light cases without bacilli," 2; of 4 "severe cases," 4; of 28 patients with pleuritis, 1; of 4 children, 1; of 10 cases with "glandular tuberculosis and miliary tuberculosis" 1.—*Sanocrysinbehandlung, K. Secher, Klin. Wchnschr., August 26, 1928, xxxv, 1640.*—(*M. P.*)

Treatment of Pulmonary Tuberculosis with Sanocrysin.—In chronic fibrocaseous tuberculosis that is slowly progressive in spite of sanatorium treatment, sanocrysin is of use as an added form of therapy. The most notable result of sanocrysin treatment is diminution in the quantity of sputum and disappearance of tubercle bacilli from the sputum. Sanocrysin is useful when collapse has been induced in one lung by artificial pneumothorax, and the disease begins to spread on the other side. The complications that might arise from this form of therapy are albuminuria, metallic taste in the mouth, vomiting, rheumatic pains, and erythematous rash.—*The Therapeutic Value of the Heavy Metals in Pulmonary Tuberculosis, L. S. T. Burrell,*

Brit. M. J., October 27, 1928, no. 3538, 737.—(W. I. W.)

Treatment of Pulmonary Tuberculosis with Sanocrysin.—Patients with chronic pulmonary tuberculosis, who are failing to improve or are becoming slightly worse under simple routine treatment, do in many cases show remarkable improvement as soon as they are given sanocrysin, and the most striking change is the diminution in the quantity of sputum and tubercle bacilli. In most cases of chronic pulmonary tuberculosis there are periods of quiescence and activity. Sanocrysin seems to cut short that period of activity and to initiate one of quiescence or arrest, but it does not prevent the liability to relapse. In acute cases sanocrysin often fails to produce any effect whatever, but it will sometimes check the spread of the disease, especially if combined with artificial pneumothorax. The dangers and complications of sanocrysin treatment are not great provided the dosage is carefully regulated.—*Sanocrysin in the Treatment of Pulmonary Tuberculosis, L. S. T. Burrell, Tubercle, September, 1928, ix, 570.—(W. I. W.)*

Asthma as Remote Effect of Tuberculosis.—The clinical pathology of asthma is effected by three etiological units. tuberculosis, syphilis and malaria, which occur symbiotically in the human body. Etiologically the tubercle bacillus is associated with all possible diseases and disease conditions, and this is true of asthmatic conditions as well. Specific and nonspecific preparations call forth the same action in these conditions. Protein therapy can thus become a general therapy, affecting the disposition and temperament of the case. Too little is known about the dosage and the type of protein substance to be preferred in these conditions.—*Die asthmatischen Zustände als Fernwirkungen der Tuberkulose-Infektion. Klinik der tuberkulösen Symbiose, F. Bialokur,* Ztschr. *f. Tuberk., 1928, xlix, 420.—(H. J. C.)*

Peptone Treatment of Asthma.—Sixty cases of bronchial asthma were treated with peptone. No benefits were noted, and this form of therapy is of no value in cases of bronchial asthma.—*Peptone Treatment in Bronchial Asthma, M. A. Ramirez, Arch. Int. Med., September, 1928, xlii, 368.—(W. I. W.)*

Heredity in Allergic Diseases.—Inheritance appears to be the chief factor in determining whether or not an individual will ever develop hay fever or asthma, and to some extent governs the time in life when symptoms may appear. The earlier in life an individual becomes sensitive, the greater the tendency to develop a sensitiveness to more than one group of proteins. The extent to which an individual is exposed to any given protein has much to do with determining whether or not a sensitiveness to that particular protein will develop. The substance to which patients become specifically sensitive, chemically and clinically, is in many cases, a nonnitrogenous one. Clinically, the substance, whether protein or nonprotein, to which patients become specifically sensitive, may be found in cow's milk and breast milk. A child may be born specifically sensitive to a food protein or a substance closely associated with it. The ability to become sensitive is transmitted from one generation to another, but not the specific state. The character of the inheritance is as a single dominant one. It appears that in the linkage eczema and migraine are interchangeable with hay fever and asthma. Allergic patients develop a general resistance to infectious disease which is far above the normal. A careful detailed history will usually determine whether an asthma or hay-fever patient has complications that need investigation other than tests for a specific sensitiveness. Allergic patients whose symptoms manifest themselves within the first or second decade seldom develop tuberculosis. Hay fever and asthma are comparatively absent in the insane. From our findings it appears that allergic students may be far above the normal in intelligence.—*The Hereditary Factor in Allergic Diseases. With Special Reference to the General Health and Mental Activity of Allergic Patients, R. M. Balyeat, Am. J. M. Sc., September, 1928, clxxvi, 332.—(W. I. W.)*

Acute Laryngotracheobronchitis.—This disease usually develops in the course of an acute respiratory-tract infection, most frequently during seasonal epidemics. Occurring almost exclusively in children of nine or under, it is usually ushered in with an acute rhinitis and pharyngitis, but may be primary in the larynx and trachea. At first, for an indefinite period, there is a dry, croupy cough with moderate elevation of temperature. If the serious type of involvement occurs, the respirations become more definitely embarrassed; suprasternal, supraclavicular and epigastric retraction is seen, and the patient gradually develops cyanosis, the latter not such as is seen in sudden laryngeal obstruction, but the pale cyanosis of gradually increasing respiratory embarassment, with its attendant exhaustion and great strain on the heart. Emergency

intubation or tracheotomy results in immediate restoration of good color and fairly good pulse. In these cases intubation should be resorted to as soon as possible, not waiting for definite evidence of impending asphyxiation. If necessary to retain the tube longer than three weeks, a tracheotomy should be done. The physical signs are often deceptive, and the X-ray is the most certain means of diagnosis. There may exist an accompanying bronchopneumonia or lobar pneumonia. On direct examination the laryngeal mucous membrane is usually inflamed and slightly cyanotic. The tracheal membrane is dusky red and slightly thickened. Inflammation is marked at the bifurcation, and extends into the bronchi. There is a very sticky secretion present, and occasionally plugs of semidried secretion in one or both bronchi. The obstruction to respiration is practically always due to extreme swelling in the subglottic space. Occasionally there is glottic spasm. Frequently there is a deceptive low temperature, which quickly climbs, however, after restoration of the airway. Should the thick, sticky secretion accumulate at the bifurcation and plug the bronchus, following the establishment of a clean airway above, the child quickly succumbs unless bronchoscopy is promptly done for removal of the obstruction. Occasionally, substitution of an intubation tube for the tracheal cannula relieves the patient, as the latter may increase the difficulty of expulsion by causing too rapid evaporation of secretion. The use of immune blood, when procurable, has given good results. A guarded prognosis should be given, as pneumonia may develop in spite of a clean airway. The grave importance of the exhaustion factor in partial laryngeal obstruction should be emphasized.—*Acute Laryngotracheobronchitis, H. L. Baum, J. Am. M. Ass., October 13, 1928, xci, 1097.*—(*G. L. L.*)

Pulmonary Sequellae of Tonsillectomy in Children.—Pulmonary complications following tonsillectomy include pneumonia, abscess and foreign body. A series of 15 posttonsillectomy lung abscesses is described. The treatment must be considered in three ways: (1) medical, (2) medical plus bronchoscopy, and (3) surgical. The prospect for spontaneous recovery is fairly good. Death results in the majority of cases that do not recover within three months.—*The Pulmonary Sequellae of Tonsillectomy in Children, A. E. Fischer, Am. J. M. Sc., August, 1928, clxxvi, 253.*—(*W. I. W.*)

Massive Collapse of Lung.—Roentgenographic examination revealed massive collapse of the left lung with associated pneumothorax following an asthmatic attack. Since the existing pneumothorax was sufficient to partly equalize the pressure caused by the collapse of the lung, no narrowing of the chest, displacement of the mediastinum or elevation of the diaphragm was produced, but slight tracheal displacement towards the involved side was noted. It was demonstrated that merely rolling the patient on the uninvolved side with the collapsed lung uppermost, and causing him to cough, caused reinflation of the collapsed lung under direct roentgenoscopic observation.—*Massive (Atelectatic) Collapse of the Lung, L. R. Sante, Am. J. Roentgenol. & Rad. Therapy, September, 1928, xx, 213.*—(*W. I. W.*)

Complete Traumatic Separation of Bronchus.—The autopsy is recorded of a woman, 31 years of age, in whom there was found a complete severing of the right bronchus. It terminated 3 cm. from the bifurcation of the trachea and was surrounded by scar-tissue. There resulted the complete contraction of the right lung, with the distal part of the bronchus separated 3 cm. from the proximal end. The left lung, which was vicariously hypertrophied, was involved by chronic progressive tuberculosis. The size of the right bronchus and the right pulmonary artery was about normal. This led the author to the conclusion that the result noted was the outcome of an accident and was not hereditary. The history disclosed a severe trauma to the patient at the age of 10 years, when an 80-kgm. wine-barrel fell upon her chest and fractured four ribs. This was followed by a protracted illness with slow recovery. It is interesting that a severe trauma of this type did not result in death and that the completely segregated right lung was not afflicted with tuberculosis in spite of the widespread disease in the left lung. No trace of the rib fractures could be found at section.—*Zur Kasuistik einer vollständigen Zerreissung des rechten Luftröhrenastes, S. I. Krinitzki, Virchow's Arch. f. path. Anat., 1928, cclxvi, 815.*—(*H. J. C.*)

Lung Abscess.—Former experiments to produce chronic abscess of the lung by the method of freeing into the venous circulation small, artificially enclosed septic emboli, constructed of segments of veins containing bacteria and blood, were not successful. Acute abscesses were produced, but the majority healed within three weeks by cicatrization. Later studies showed that the virulence of the microörganisms and the resistance of the host were of great impor-

tance. Work by others concerning the influence of artificially produced cough on the chronicity of abscess of the lung, was checked by confining the animal in a chlorine-gas chamber for a few minutes three times a day. Abscesses were prolonged for a period of four to five weeks, but no longer; therefore cough alone is not able to account for the chronicity of lung abscess. Experimenting with the anaerobic group of microörganisms, small pieces of cotton impregnated with the scrapings from the alveolar margins of a well-advanced case of pyorrhoea were clamped into a skin clip and introduced into the bronchus. The foreign body remained more than twelve days in only one of six experiments, and in this case produced a bronchiectatic abscess with foul, greenish pus, in which spirochaetes and fusiform bacilli were demonstrated. Other experiments seem to indicate that production of lung abscess by the introduction of material impregnated with anaerobes into the respiratory tree depends on complete occlusion of the air-passages for a sufficient length of time to allow the anaerobes to grow. During other experiments anaerobes were introduced into the blood-stream in an embolus, and the material from the oral cavities seemed to produce lesions more nearly simulating the chronic abscess of the lung as found in man, with an irregular-shaped cavity lined with a grayish exudate, and surrounded by a thick fibrous wall. The pus was thick, and often greenish, and had a foul odor. In the true parenchymatous abscess of the lung the infection probably travels by means of the blood-stream. For example, abscess of the lung frequently follows operations around the nose or throat, and thrombi with bacterial contamination have been frequently demonstrated in vessels of operative wounds of the tonsillar regions. Spirochaetes and fusiform bacilli have been demonstrated in brain abscesses following pulmonary spirochaetosis. The fact that under experimental conditions insufflated material must actually block the air-passages completely, as well as injure the bronchi, before an abscess can be produced, and the fact that arsenical drugs which will kill spirochaetes rarely cure pulmonary abscesses in man, suggests that these microörganisms are probably secondary invaders. Occlusion of the finer bronchial ramifications by a foreign body or grossly contaminated material usually results in a bronchiectatic type of abscess, which responds well to treatment when the foreign body is removed.—*Abscess of the Lung: Experimental Studies in Chronicity, I. F. Weidlein and L. G. Herrmann, J. Am. M. Ass., September 22, 1928, xci, 850.*—(*G. L. L.*)

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